British Columbia Community Forest Association
Extension Note No. 6 December 2012

Adapting to Climate Change: Are British Columbia's Community Forests Meeting the Challenge?

ELLA FURNESS

Community forest organizations in British Columbia are on the front lines of our changing climate. Such local grassroots groups, usually run by voluntary boards of directors, are often more effective than top-down, rigid, centralized organizations in building resilience to environmental stressors. Nevertheless, communities and organizations vary widely in their ability to adapt to changing conditions. By adopting practical adaptation strategies, the province's community forest organizations can improve their ability to cope with future conditions. This extension note describes research I conducted that explores the current ability of active community forest organizations in adjusting to the effects of climate change (Furness 2012).[1] I also discuss some ways in which these organizations could improve this ability.

THE IMPACTS OF CLIMATE CHANGE ON BRITISH COLUMBIA'S FORESTS

Canada's forests are already experiencing the effects of climate change, with documented increases in drought conditions, insect attacks, tree diseases, and wildfires. These large-scale disturbances are likely to persist, putting pressure on local communities by affecting timber quality and production, watersheds and water availability, and increasing risks to human health from smoke and fire.

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In British Columbia, climate change is partially responsible for the devastating mountain pine beetle infestation, giving us an indication of some of the future impacts facing forest-dependent communities. Specifically, we can expect to see increases in biotic damage and forest diseases, as well as increases in the frequency and intensity of droughts in the Southern Interior, species migration, and loss of habitat in high-elevation forests. The province's community forests are already (or will be) strongly affected by climate change. Therefore, the way community forest organizations plan for and respond to these changes could significantly influence whether they

[1] For a full list of the references used to develop this research project, go to: *https://circle.ubc.ca/bitstream/handle/2429/42804/ubc_2012_fall_furness_eleanor.pdf?sequence=1*

avoid or reduce the negative impacts of climate change on their organizations and communities.

THE CAPACITY TO ADAPT

All people and organizations have an "adaptive capacity." Probably the most widely cited definition of adaptive capacity is that of the Intergovernmental Panel on Climate Change:

> *Adaptive capacity is the ability or potential of a system to respond successfully to climate variability and change, and includes adjustments in both behaviour and in resources and technologies* (Adger et al. 2007).

An organization's or a community's adaptive capacity is determined by its access to economic and physical resources, natural resources, and social and human capital. The type of values and attitudes it holds will also affect its ability to adapt. All determinants of adaptive capacity will have different influences at different scales. Therefore, responses to climate change at the national scale and the scale of the individuals will vary, although interactions can occur between these two scales.

Research Approach

As part of my research, I asked active members of the BC Community Forest Association to participate in a survey that explored their current adaptive capacity (Figure 1). "Active members" were considered as those who had a Community Forest Agreement and forest stewardship plan in place. To create a detailed description of these organizations, this survey measured their access to resources, documented how they are governed, and catalogued their values. In addition, the survey gauged the organizations' awareness of, and response to, climate change, as well as any adaptation techniques already under way.

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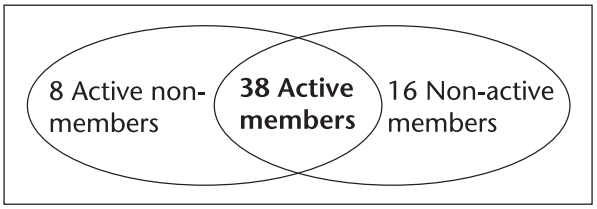

FIGURE 1 *Of the 62 community forest organizations in British Columbia, 38 are BC Community Forest Association members with active operations.*

To gain a picture of the adaptability of community forest organizations, managers were asked about:

- their access to economic and physical resources, natural resources, and social and human capital;
- their values; and
- their observations of, and expectations about, climate change.

Four different statements about each variable were read to organization managers, who were then asked to what extent they agreed with the statement (Figure 2).

RESULTS

Of the 62 community forest organizations in British Columbia, 46 had active operations, 54 were members of the BC Community Forest Association, and 38 were association members with active operations. These 38 organizations represented the survey sample. As all responded to the survey, a 100% response rate was achieved.

The survey results established that the concept of adaptation was relevant to many of these organizations: 45% of the organizations (17 "Stage 1 Adaptors") were already researching adaptation, and 32% (12 "Stage 2 Adaptors") were already integrating adaptation techniques into their work. Of the remaining organizations, 16 were non-adaptors, and a small minority (4) was unsure. Figure 3 illustrates the adaptation progress of all organizations in the sample (see sidebar, "Example Survey Questions: Attitudes to Climate Change and Adaptive Capacity").

The most commonly experienced or anticipated climate change impact was an increase in insects and diseases in the forest; extreme events were

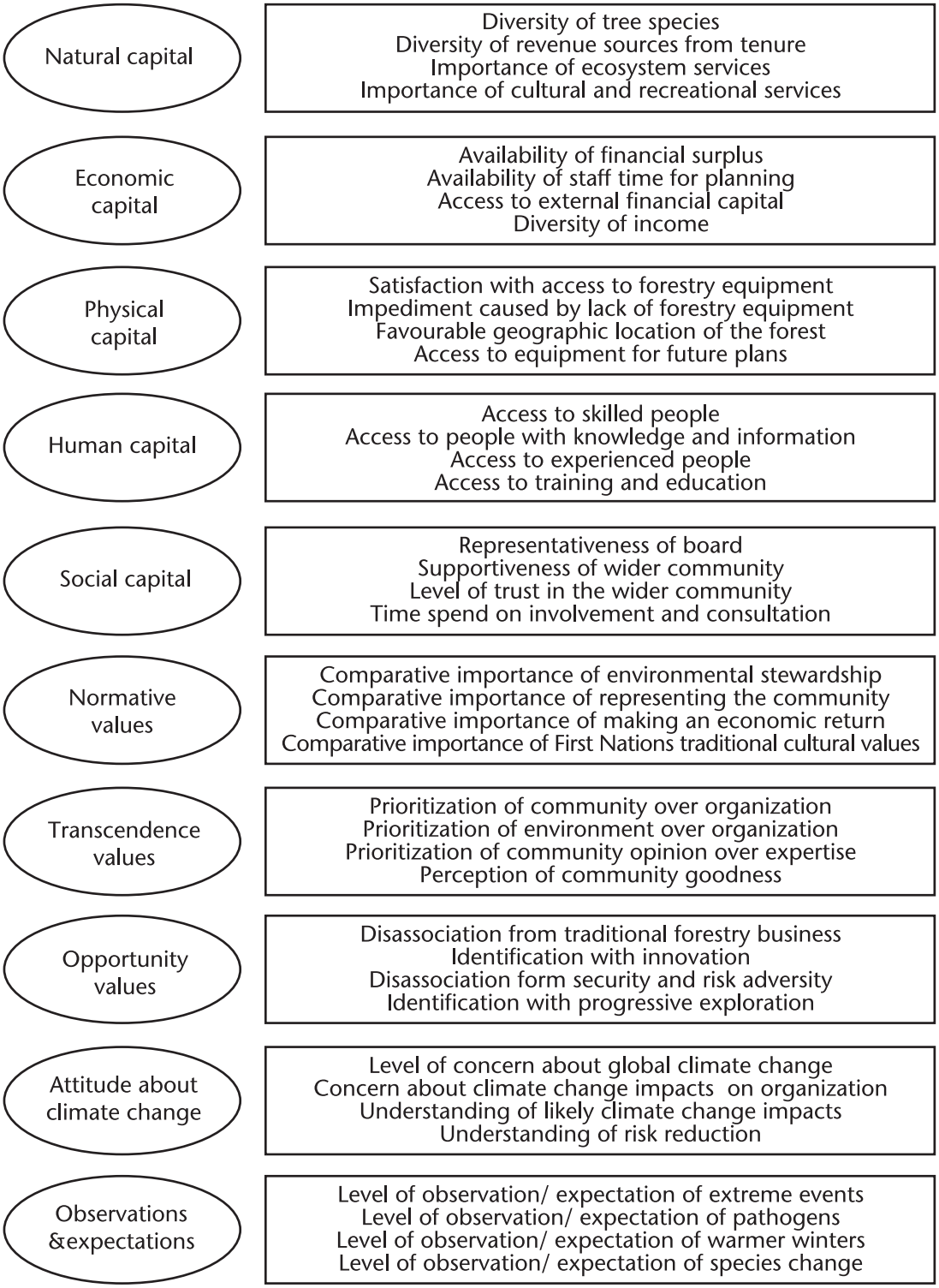

FIGURE 2 *Survey variables used to measure current adaptive capacity of community forest organizations.*

also frequently observed or expected, but species changes and warmer winters were less so. Table 1 shows these results in more detail.

Attitudes toward climate change were substantially different between non-adaptors and adaptors; adaptors were more concerned

EXAMPLE SURVEY QUESTIONS: ATTITUDES TO CLIMATE CHANGE AND ADAPTIVE CAPACITY

Concerning attitudes to adaptive capacity and climate change, survey respondents were read the following four statements and asked whether they: (1) strongly disagree; (2) disagree; (3) neither agree nor disagree; (4) agree; or (5) strongly agree.

Adaptive Capacity – *As an organization, we have:*

1. *a long-standing historical connection through ownership, use, and enjoyment of the land;*
2. *begun to put plans into place for what we might be able to do to minimize the impacts of climate change on our organization;*
3. *already begun to make adaptations to our work to minimize the likely future impacts of climate change on our organization; or*
4. *yet to do anything to minimize the impacts of climate change.*

Attitudes to Climate Change – *Within our organization, we:*

1. *are concerned about global climate change in general.*
2. *are concerned climate change will have an impact on our ability to achieve our goals as an organization.*
3. *have an understanding of the likely impacts of climate change on our community forest.*
4. *have an understanding of how we could reduce the risk of the effects of climate change.*

about global climate change, and were more likely to have observed, or expected to observe, the impacts of climate change (see Table 2).

The three groups—non-adaptors, stage 1 adaptors, and stage 2 adaptors—had distinct characteristics that suggest factors which may enable the process of adaptation. For example, stage 1 adaptation is associated primarily with the organization's attitude toward global climate change and its perception of climate change impacts on the forest, as well as the presence of pro-environmental values, community investment and trust, and access to financial resources and training. For stage 2 adaptors (i.e., the most advanced organizations), access to resources seemed more important than pro-environmental values and concern about the direct impacts of climate change on their community forests. Overall, these organizations had observed less of the likely impacts of climate change than stage 1 adaptors (Table 1). Nevertheless, concern about global climate change, as well as community investment and trust, remained important features for the stage 2 adaptors and, as a group, they invested more time and trust in the community (see Figure 4).

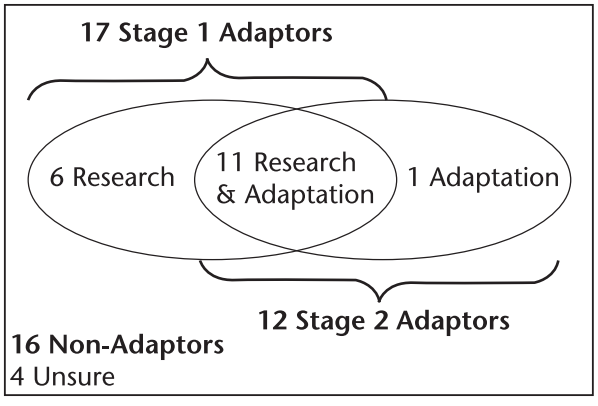

FIGURE 3 *Adaptation progress among the 38 community forest organizations surveyed.*

TABLE 1 *Observations and expectations of climate change among non-adaptors, stage 1 adaptors, and stage 2 adaptors*

Non-adaptors (16 organizations)	Stage 1 adaptors (17 organizations)	Stage 2 adaptors (12 organizations)
11 (69%) have observed or expect to observe an increase in extreme events	13 (77%) have observed or expect to observe an increase in extreme events	10 (83%) have observed or expect to observe extreme events
12 (74%) have observed or expect to observe an increase in pathogens in the forest	16 (94%) have observed or expect to observe an increase in pathogens in the forest	11 (92%) have observed or expect to observe an increase in pathogens in the forest
3 (18%) have observed or expect to observe warmer winters	11 (65%) have observed or expect to observe warmer winters	8 (67%) have observed or expect to observe warmer winters
6 (40%) have observed or expect to observe species change	12 (71%) have observed or expect to observe species change	8 (67%) have observed or expect to observe species change

TABLE 2 *Attitudes to climate change among non-adaptors, stage 1 adaptors, and stage 2 adaptors*

Non-adaptors (16 organizations)	Stage 1 adaptors (17 organizations)	Stage 2 adaptors (12 organizations)
7 (44%) are concerned about global climate change	14 (82%) are concerned about global climate change	11 (92%) concerned about global climate change
7 (44%) are concerned about the impacts of climate change on their organization	12 (73%) are concerned about the impacts of climate change on their organization	8 (67%) are concerned about the impacts of climate change on their organization
2 (12.5%) have an understanding of likely climate change impacts	12 (71%) have an understanding of likely climate change impacts	9 (75%) have an understanding of likely climate change impacts
1 (6%) has an understanding of risk reduction	12 (71%) have an understanding of risk reduction	10 (83%) have an understanding of risk reduction

APPLICATION OF THE RESEARCH FINDINGS

The findings of this research suggest some valuable ways in which community forest organizations could improve their ability to adapt to the effects of climate change. In this, the BC Community Forest Association could assume an increased role in facilitating dialogue among community forests and creating more opportunities for participation.

Targeted Training

Targeted training should increase an organization's understanding of climate change adaptation techniques. For example, research carried out with Swedish foresters suggested that information on risk reduction is possibly more important than information on the likely impacts of climate change. Although British Columbia's foresters may have different information gaps

FIGURE 4 *Percentage of organizations with a particular component of adaptive capacity.*

concerning adaptation techniques, further research could help confirm whether training programs were addressing the needs of the province's community forest organizations.

Workshops and Conferences

In the survey, managers of adaptive community forest organizations reported positive training experiences, with staff and board members attending workshops and seminars on climate change provided by government bodies, universities, or through other research initiatives. The BC Community Forest Association could play a role here by creating more participation opportunities for seminars or conferences.

Partnerships

Community forest organizations could benefit from partnerships with external organizations (universities, public bodies, corporations) by collaborating on landscape-scale projects, sharing resources, and working together towards shared goals related to climate change adaptation.

Collaboration and Communication

Previous research suggests that learning and trust are interlinked; that well-developed networks of people learn more from past events, identify new information, and develop capacity to cope with change by exchanging ideas and knowledge. Conversations and "social learning" (communities learning together) is important in adaptation and can provide a safety net when other resources are not available. The BC Community Forest Association could play an increased role in facilitating dialogue among the province's community forest organizations about climate change adaptation, and in developing an online resource hub with message boards designed to expand the sharing of ideas and information between the organizations.

Organizations enthusiastic about adaptation could become models, with their progress and actions documented as case studies.

Models of Adaptation

Of the surveyed organizations who were motivated to adapt, those with better access to economic resources and expertise were more likely to have advanced from planning into action. Therefore, a grant program could be very beneficial in promoting adaptation to climate change. With adequate financial resources, community forest organizations could link with experts and staff could engage in adaptive activities. Organizations enthusiastic about adaptation could become models, with their progress and actions documented as case studies. This could help other community forest organizations to visualize potential climate change impacts and to imagine the possible adaptive options open to them. Any organization can more easily follow a path already travelled successfully by others. Providing resources to those who wish to take the first steps in adaptation to climate change will allow them to lead by example.

RESOURCES: ADAPTING TO CLIMATE CHANGE

A growing number of websites and publications offer valuable information on climate change adaptation. Here are a few examples.

- *Setting the Context for Adapting to Climate Change in British Columbia: http://www.for.gov.bc.ca/het/climate/actionplan/index.htm*
- *Adapting British Columbia's Natural Resource Management to Climate Change: http://www.for.gov.bc.ca/het/climate/index.htm*
- *Climate Change: Research Topics: http://www.for.gov.bc.ca/hre/topics/climate.htm*
- *Future Forest Ecosystems Initiative: https://www.for.gov.bc.ca/HFP/future_forests/*
- *Helping Canada's Forest Sector and Society Adapt to Climate Change: http://cfs.nrcan.gc.ca/pages/35*
- *Pacific Institute for Climate Solutions: http://pics.uvic.ca/*
- *Fraser Basin Council: Retooling for Climate Change: http://www.retooling.ca/*

A LAST WORD FOR ORGANIZATIONS WISHING TO ADAPT

As well as working with the BC Community Forest Association to organize training, conferences, partnerships, and communication, and lobbying for increased resources, community forest organizations can also do many things on their own. Here are some examples.

1. Identify any barriers you may have to adapting to climate change and create a plan to address these barriers.
2. Access some of the abundant information now available on forests and climate change (see sidebar, "Resources: Adapting to Climate Change").
3. Find people who already understand some adaptive management ideas and invite them to talk to your board.
4. Look for allies in the forest industry, government, and universities. See whether they want to share resources and work together on pilot projects.
5. Talk to community members who may have ideas or knowledge about climate change and potential adaptive strategies.

The BC Community Forest Association website is a good place to start your organization's journey toward climate change adaptation. For more information, go to ***http://www.bccfa.ca***.

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BRIDGES – LINKING RESOURCES FOR COMMUNITY FORESTS

A project supported by the Community Development Program of Agriculture and Agri-Food Canada and an anonymous donation.

Bridges will assist community forest organizations to gain access to the appropriate tools, information, and relationships that will improve their productivity and stimulate new opportunities to develop durable economic activities.

BC Community Forest Association
A network of rural, community-based organizations engaged in community forest management and those seeking to establish new community forests.

University of British Columbia Alex Fraser Research Forest
A department of UBC Forestry that positively affects natural resource stewardship through education, research, and extension.